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AUTHOR Katz, Martin R.
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ABSTRACT

Although theories of career decision making and guidance are usually offered as a basis for practice, the linkage between such theories and the practices of counselors is not always clear. Since treatment in a private dyadic context is difficult to observe and classify, public treatments such as workbooks or computerized systems are more useful for examining theoretical issues. Despite its association with the Armed Services Vocational Aptitude Battery (ASVAB) and the Department of Defense, the workbook "Exploring Careers: The ASVAB Workbook" was developed to help all high school juniors and seniors make informed and rational career decisions in both civilian and military settings. This report presents information on the ASVAB workbook based on research and development carried out over many years at Educational Testing Service. It considers issues such as: (1) why one structure and not another was used for individual assessment and for occupational information; (2) what procedures were followed to obtain, analyze, and interpret occupational information; (3) what model of career decision making was used; and (4) what evidence there is that students can handle the concepts. An overview of the model of career decision making is presented. A section on self-assessment defines the particular structure of each domain in assessment for career decision making and describes the derivation of the dimensions that it comprises. Sources and analyses of occupational information are presented and design features are described. (NB)

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RESEARCH REPORT

THEORY AND PRACTICE: THE RATIONALE FOR A CAREER GUIDANCE WORKBOOK

Martin R. Katz

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THEORY AND PRACTICE: THE RATIONALE FOR A CAREER GUIDANCE WORKBOOK

Martin R. Katz

Senior Research Scientist

Educational Testing Service
Princeton, New Jersey

October 1986

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ABSTRACT

Theoretical issues such as the structure of individual attributes and their linkage to occupational information are examined in the context of a new workbook.

THEORY AND PRACTICE: THE RATIONALE FOR A CAREER GUIDANCE WORKBOOK

Although theories of career decision making (CDM) and guidance are usually offered as a basis for practice, the linkage between such theories and the practices of counselors is not always clear. Counselors who espouse different theoretical frameworks sometimes behave in similar ways, while practitioners who profess allegiance to a given school of thought may vary in their behaviors. Indeed, a counselor may be inconsistent from one occasion to another. Thus, the actual "treatment" in a private dyadic context is hard to observe and classify, and counselors are seldom held to account for their rationales.

More visible and accountable are such public treatments as workbooks or computerized systems. "Public" does not imply any lack of privacy for individual users. Rather it signifies that the content of the treatment is explicitly specified, is open to examination, is consistent across occasions, and is available for use by large numbers of people. It may be responsive to individual differences, but the distinctive responses emerge from a constant content and structure. Such public treatments therefore provide a clear field and focus for examining theoretical issues. It seems particularly important that the rationale for a public treatment scheduled for widespread use be described and scrutinized.

In fall 1987, more than a million students who take the Armed Services Vocational Aptitude Battery (ASVAB) at over 14,000 high schools will receive copies of Exploring Careers: The ASVAB Workbook, developed by Educational Testing Service for the Department of Defense. Notwithstanding this linkage to ASVAB and the DOD, the workbook emphasizes processes of CDM for civilian as well as military occupations. It is designed to help all high school seniors and juniors make informed and rational career decisions.

Some distinctive features of the workbook are highly visible, such as a series of comic strip episodes and a chart of occupational information that uses latent images: Students run a special marker across rows that represent the characteristics they want; asterisks appear in the cells under the titles of occupations that have those characteristics. Students can then see at a glance which occupations meet all or most of their specifications. This feature simulates the structured search function of a computer. (Running the marker down columns provides direct access to information about attributes of selected occupations.)

Counselors and students can readily see and judge these features for themselves. But as people whose profession is partly science and partly art, counselors will want to dig beneath the surface to get some sense of the rationale, the research evidence, and the design principles on which the workbook is founded. They are entitled to see these compared with counter propositions that support other approaches and resources. Thus, a particular treatment offers an opportunity to examine theoretical issues of general concern. This paper, then, will consider quite specifically such issues as why one structure and not another was used for individual assessment and for occupational information; what procedures were followed to obtain, analyze, and interpret occupational information; what steps were taken to insure accuracy and currency of the information; what model of career decision making was used; what evidence there is that students can handle the concepts; and so on.

The following brief answers to these and other questions are based on research and development carried out over many years at Educational Testing Service -- from the ETS Guidance Inquiry of the 1950's to the System of Interactive Guidance and Information (SIGI) and SIGI PLUS of the present.

1. Model of Career Decision Making: an Overview

We start with the premise that a major objective is to help students make informed and rational career decisions, and also help them learn the process so that they can continue to make such decisions in the future.

For practical purposes, the first function in our model is to help each student narrow the staggering number and bewildering variety of occupations to a comprehensive but manageable list of options worthy of further consideration. (For the student, the search does not just eliminate occupations; it often suggests occupations not previously known or considered.) The second function is to make finer distinctions between occupations on the list and so close on a choice that offers an optimal combination of desirability and probability for each student.

To initiate the first function, students specify the occupational attributes that are important to them. These specifications generate a list of occupations that meet their specifications. To accomplish this, the model requires a data base of occupations with ratings on all attributes relevant to students' specifications. The listing of occupations for any student's first set of specifications provides a "rough cut" of options for further consideration. If any occupation of interest to the student does not show up on the list, its attributes can be compared with the specifications to see why it did not qualify. With manageable lists in hand, students are ready to close in more finely on at least a tentative choice.

For the second function of our model, we recognize two sides to each choice: One side consists of what each student hopes to get -- the rewards and satisfactions that may be more or less important to each individual and more or less likely to be available in each occupation. The other side is what skills and education each occupation requires, and how well the student can meet these requirements.

Looking at both sides, most students will want to make choices that provide the greatest rewards and satisfactions and avoid what they regard as excessive risks and investments. First, they need to define what is most desirable to them in such a way as to differentiate between occupations. Having identified desirable occupations, they need to assess their chances of entering each one. Then, they need a way of balancing desirability and chances of entry as they come to closure on a decision. (This process is summarized graphically by the students as they fill out "Deciding Squares" in the workbook, with the desirability of each occupation represented on one axis of the square and their chances of success in entering it on the other. The square enables them to compare occupations on both dimensions simultaneously.) Finally, they need to form action plans and take next steps.

In carrying out these functions, students must recognize that perceptions of the importance and magnitude of various rewards, satisfactions, risks, and investments vary from one person to another. That is why we start with individual assessment. In the course of examining domains for assessment, reasons will be given for preferring the model outlined above to other models in common use.

2. Self Assessment

Assessment of individual characteristics is unenlightening for informed and rational CDM unless the results have been understood and introcepted by the student. It is essential, therefore, for students as well as counselors to understand the domains of individual differences that are relevant for CDM. This section defines the particular structure of each domain and describes the derivation of the dimensions that it comprises.

Three domains that have figured prominently in assessment for CDM include values, interests, and a set of characteristics that have been

called by such names as aptitudes, abilities, skills, and knowledge. In our research we have collected evidence of the independence of these domains in the assessment of high school juniors and seniors (Katz, Norris, & Halpern, 1970; Norris & Katz, 1970). Briefly, they can be defined as follows: The first two domains represent somewhat different sources of satisfaction (Katz, 1963, 1969). People's values express what they want and desire, what outcome or state is important to them. Their interests indicate preferences for various ways of obtaining what is important, a liking for activities of one sort or another. For example, altruism and high income are two occupational values. How one likes to help people or make money, such as counseling, providing medical care, repairing machinery, or solving mathematical problems, is a function of occupational interests.

People sometimes get confused because the concept of interest itself -- engaging in an activity that is intrinsically enjoyable -- may be more or less highly valued by various individuals. The widespread use of interest inventories assumes that intrinsic activity interest is almost universally the main source of satisfaction in occupations. Our studies have demonstrated that, although interests are very often among the main satisfactions sought in occupations, they are not the sole concern. For many people, such rewards and satisfactions as may come from high income, altruism, security, independence, and such other values dimensions are often more important (see, e.g., Chapman, Katz, Norris, & Pears, 1977; Norris, Katz, & Chapman, 1978). Indeed, many people seek satisfaction of their main interests not in their chosen occupation but in avocational activities. (Consider, for example, the majority of those with a strong interest in areas that require exceptional talent for occupational success, such as sports and the performing arts.)

Nomenclature for the third domain (variously called aptitudes,

abilities, skills, knowledge) is controversial, but in operational terms the reference is to the probability of successful performance either in training for an occupation or on the job itself. Tests such as those in ASVAB and the General Aptitude Test Battery of the U.S. Employment Service are often used to assess such probabilities. They attempt to measure performance on tasks designed to represent or correlate with skills required for success in the occupation or in training for it.

Just as some approaches to career guidance focus on the use of interest inventories, others are based primarily on aptitude measures. While such measures often contribute to knowledge of probabilities of success, they -- like interest inventories -- fall short of providing the sole or primary differentiation of occupations for CDM. Their primary use may come not so much in guidance as in selection. The reasons for this lie in the nature of the information they provide.

A long history of research (most recently Thorndike, 1985, and Hunter, Crosson, & Friedman, 1985) shows that almost all of the predictive validity apparent in scores on the best-known batteries of aptitude tests is attributable to the common or general factor in the tests. Aptitude batteries have demonstrated very little differential validity. That is, to the extent that a battery measures general cognitive ability, it usually contributes to knowledge of the probability of success in most occupations. But different patterns of scores on the various tests in the battery fail to add significantly to the validity of predictions that people are likely to do better in some occupations than in others.

Aptitude scores that correlate with work performance may be useful to an employer for initial screening from an applicant pool because increments in the overall score level of applicants selected can often (depending on the base rate and the selection ratio) result in an increase in total productivity.

But such initial screening of occupations by aptitudes required is not equally useful in the guidance of students. It is limited by the lack of differential validity. Furthermore, as far as aptitude scores can predict, most students have substantial probabilities of success in unmanageably large numbers of occupations. The information such tests give about chances of success can best be brought to bear on options that have already been identified as desirable. The point is that in CDM chances of success moderate desirability but cannot substitute for it. Accumulated information (including test scores) that bears on chances of success helps keep CDM grounded in reality; it helps students deal with requirements and risks, but not with opportunities for rewards and satisfactions.

Nor can a uniform numerical algorithm (e.g., multiplying an index of probability by an index of desirability, as in multiple attribute utility theory -- see, for example, Pitz & Harren, 1980) be applied universally in balancing rewards and risks. Any probability statement for entry or success in an occupation has different meanings for different individuals. While successful performance is a goal from the employer's point of view, it is a means to an end for the candidate -- whose goals are the rewards and satisfactions that would accrue from employment in an occupation that is instrumental in providing returns consistent with the candidate's most important values. As Cronbach & Gleser (1957) emphasize in their treatise on personnel decisions:

"The decision for each [student] must be evaluated on a different scale of values. Since the student will make a particular choice only once, it is manifestly impossible to seek a strategy which is superior on the average, for the average has no meaningful definition."

Thus, the Deciding Square embodies no easy arithmetic reconciliation of the two axes of desirability and probability. In short, our model

defines appropriate roles for values, interests, and skills or abilities, helping students balance them in CDM, rather than focusing exclusively or disproportionately on measures of any single domain.

Almost every attempt to assess a given domain seems to involve some variation in the dimensions that it comprises. Our next concern, then, is to describe the derivation of the dimensions used in our model.

Dimensions of values. The dimensions of values used in the student workbook are based on research for the values sections of SIGI and SIGI PLUS. We started with the need to define dimensions that were comprehensive, although obviously not exhaustive. We wanted to include all values of importance to significant proportions of the population, without exceeding a manageable number. The dimensions had to show individual variation; there would be no purpose in including values that were universally regarded as essential or universally rejected. They had to be meaningful and relevant, capable of definition in operational terms and capable of linkage to occupational rewards and satisfactions. They had to be relatively independent; the degree of importance attached to one must not automatically subsume the same degree of importance for any other.

We did a number of studies on the dimensions of values, and of course took into account the research of others. In our own research (summarized in Katz, 1974), we asked students in structured interviews questions designed to elicit the dimensions along which they construed and evaluated occupations. For example, we asked them to tell us what they knew about an occupation of interest to them, and to indicate what other information they would like to have; what appealed to them most about it, and what least; what events or additional information might make them change their preference for that occupation; what characteristics an "ideal" or "dream" occupation might have, and also a "nightmare" occupation -- the worst they could imagine (Katz, Norris, & Kirsh, 1969).

In a variation on the Role Construct Repertory test (Kelly, 1955), we gave students triads of occupations and asked them to indicate which two of the three seemed to offer satisfactions and rewards that were more nearly alike than the satisfactions and rewards offered by the third. From their responses we were able to determine the dimensions along which they construed similarities and differences in occupational satisfactions.

In a simulated occupational choice procedure (Katz, Norris, & Pears, 1976, 1978), we gave students an opportunity to ask us questions about a set of unknown occupations; from the information we gave them, they would choose one as most attractive. Classifications of their questions, along with their evaluations of the occupations in the light of the information they received, gave us an additional check on the comprehensiveness and relevance of the values dimensions we had already assembled.

In addition, as part of a questionnaire follow-up of a large national sample of high school students whose aptitude and interest scores were already recorded, we asked them to weight the importance of some dozen values dimensions. An unrestricted maximum likelihood factor analysis showed that the three domains -- aptitudes, interests, and values -- were independent. It also indicated the structure of values and the relative independence of the dimensions (Norris & Katz, 1970).

Since the values dimensions we retained are evident in SIGI and the workbook, there may be some interest here in what was discarded, and why. One such value is often called "creativity." We could not come up with a viable operational definition of it, nor were students at all consistent in their perceptions of it. It was not clear whether those who endorsed creativity valued a chance to be creative in general, or in some particular type of activity, such as verbal, scientific, artistic.

Another example is a value called sense of accomplishment or pride in work. We found that although rewards and satisfactions corresponding to

definitions of this value might differentiate between some unskilled and higher-level occupations, it did not seem useful in differentiating between the occupations to which guidance programs are usually addressed. (Most unskilled positions are chosen as a function of job characteristics, as indicated below, rather than occupational characteristics.) Furthermore, how could one rate an occupation low on this dimension in the face of the doctrine that all socially useful work can be a source of pride or sense of accomplishment?

Finally, in research studies and guidance resources, values labeled, "Work that seems important or interesting to me," "Self-actualization," and the like are often encountered. Such labels try to wrap up virtually the entire domain of values and interests in one all-encompassing dimension, leaving the task of self assessment still undone. These global labels cannot be linked to the attributes of occupations. Such a composite rating of an occupation on all attributes of importance is the outcome, not the starting point, of an analysis of what a person wants and what opportunities an occupation offers to obtain it.

Other values frequently found in the literature tend to be attributes not so much of occupations as of jobs. While such characteristics as "easy commute," "pleasant co-workers," "flexible hours," and so on may be important to many people, the opportunity to obtain these benefits varies more between jobs within an occupation than between occupations. Their flavor is local rather than generic, and they can not be used to differentiate between occupations.

The dimensions of values finally used are not exhaustive, and some additional ones are suggested in the workbook. The list presented for assessment, however, has stood up very well in the use of SIGI (Chapman, Katz, Norris, & Pears, 1977). Students perceive the dimensions as independent (intercorrelations of the weights do not tend to be high); the

weights given each value tend to vary greatly across students (as indicated by the standard deviations); each value is regarded as important by substantial numbers of students; and students rarely feel that values of importance to them have been omitted (as determined by interviews and questionnaires after their use of SIGI). These characteristics of the values have been confirmed in interviews with high school students (Tittle, 1981). Evidence of the stability of such values over a period of seven to ten years has been found in several studies (e.g., Mortimer & Lorence, 1979; Lindsay & Knox, 1984).

Dimensions of activities. The activities dimensions have been defined to permit students to make simultaneous assessments of interests and skills. These assessments can then be linked, via the extensive data base of occupational information, to occupations in which such activities are important. Thus we avoid the dubious "birds of a feather" assumptions on which occupational scales of some interest inventories are based, and the equally dubious classifications of occupations to which "homogeneous" scales of other inventories direct students.

We have also avoided the use of multiple-item inventories. Items in interest inventories are usually straightforward and transparent (e.g., lists of occupational titles or work activities and conditions). Such instruments, therefore, differ not so much in the nature of their items as in their conceptual structures -- the definitions of the domain and of the dimensions that it comprises. So it seems doubtful that having students respond to hundreds of items, then using the responses to compute scores, and then interpreting the scores to suggest occupations is really necessary. To respond in a meaningful way to the items, students must already know their likes and dislikes. In that case, they are being asked to invest the very coin they hope to earn. If they do not know their interests, an inventory provides more noise than information and is a poor

substitute for the wide-ranging experience they should be encouraged to seek. In a number of studies, the validity of single-response estimates of interest in each field has compared favorably with responses to multiple-item scales. For example, in an extensive longitudinal study involving a national sample of high schools (Katz, Norris, & Halpern, 1970; Norris & Katz, 1970), the validities and factor structure of single-response ratings were virtually identical with those of 12 highly reliable multiple-item scales.

In characterizing occupations according to skills, we had originally (in SIGI) used our own modification of the Dictionary of Occupational Titles scales of Data (to which we attached Ideas), People, Things (DPT). Only some 20 verbs are used in the DOT to represent the various levels of skills in the three categories. But work descriptions for many occupations are not (could not reasonably be) confined to just these verbs. So from large arrays of work descriptions we developed a comprehensive thesaurus of verbs (Pears & Weber, 1980) that applied to skills. Attempts to classify these under DPT resulted in some residuals and uncomfortable fits. Often an activity might straddle two or even all three types of function, and yet be more convincingly represented as a distinct entity in itself rather than be decomposed into separate functions. Architects, for example, in communicating plans to clients may use data they have synthesized, things (models) they have designed and built, as a basis for mentoring, negotiating, persuading, and so on. Thus, the act of communicating involves skills in working with all three functions: Data/Ideas, Things, and People. So the occupation Architect is rated high on all three functions. But the direct act of communicating (speaking, writing, drawing) specific kinds of information or ideas to particular kinds of people under certain defined circumstances can easily get lost in the generalized DPT functions. It seemed preferable to preserve the

specific nature of the communications engaged in by Architect with a structure that would link it to acts of communication in other occupations. The converse problem arose in trying to classify various mathematical work tasks under Data/Ideas. We could make them fit, but mathematics appeared to have a particularity that could be accommodated more comfortably if broken out of Data/Ideas into a separate category, leaving the residual components in a category called Organize/Evaluate Information.

In this way, a new structure was fashioned through an alternation of conceptual and empirical efforts. First, difficulties were encountered in fitting work tasks for occupations into the DPT structure. New structures were developed iteratively and tested. Always, several major constraints were kept in mind: The structure had to remain simple and manageable. While the number of categories obviously had to exceed three, it seemed unwise to exceed six or so. The terms used in all headings had to be familiar to students. While category headings would obviously have to represent a high level of generalization, each would have to encompass some half-dozen subcategories that could be applied across a number of occupations; eventually, in SIGI PLUS, each subcategory had to be translated in specific and distinctive terms to the work tasks of each occupation to which it applied (so the student could see an example of how the skill was used in a given occupation). The resultant structure of activities used for both skills and interests in SIGI PLUS is as follows (for purposes of the ASVAB workbook, the lists of subcategories have been shortened and reworded):

I. Work with People	II. Work with Hands or Equipment
train, instruct	operate machines or equipment
advise, counsel, interview	use tools, measure
persuade, negotiate, sell	maintain, inspect, repair
assist, protect, give physical care	install, set up, construct
coordinate work with others	draft, draw
supervise, direct, assess	design equipment, develop systems
III. Communicate	**IV. Organize/Evaluate Information**
follow written/oral instructions	keep records, catalogue, diagram
explain, answer questions	gather data, conduct research
make presentations	analyze, trouble shoot
write, prepare reports	interpret, evaluate
make speeches, broadcast, entertain	develop ideas, draw conclusions
V. Work with Mathematics	**VI. Special Activities**
mathematical reasoning	concentrate on details
calculate, compute, apply formulas	think fast
develop budgets, use statistics	memorize
analyze numerical data	perform in the arts
	work with computers

Note that categories IV, I, and II are respectively very close to Data, People, and Things; as noted above, Communicate represents a conceptual recombination of communicative activities that had been parceled among the DPT categories, and Work with Mathematics breaks out a specific subset of Data/Ideas. These two categories are congruent with everyday parlance and are instantly recognizable by users. The last category is a catch-all; it includes a miscellany of activities that are important in some occupations but cannot be comfortably classified elsewhere.

The subcategories listed under these six rubrics do not purport to be hierarchic. For use in structured search, the activities are not rated on any numerical scale. They are included only if they are important in an occupation, with no attempt to differentiate levels of importance: If they are included, they are considered above the threshold level that represents a requirement.

The iterative nature of the development of this structure, with testing of each new formulation on a sample of occupations, has produced a system that seems to "work" from the point of view of occupational

analysts: They have been able to classify work tasks for all occupations so far attempted without serious problems, and reviewers drawn from the occupations have agreed with their classifications. In field tests, clients have understood the categories and have used them appropriately.

Dislikes and disabilities. Features that students feel they "must avoid" have been reduced from a longer list used in SIGI PLUS. Although it is known that many students eliminate occupations from consideration on the basis of dislikes and disabilities (indeed, according to some of the most widely used inventories, "career maturity" is directly correlated with the number of "dislike" or negative responses), the Advisory Committee for this ASVAB project was concerned about premature exclusion of occupations, particularly when a dislike or disability was remediable. Thus, only three features are listed under this rubric, students are directed to specify no more than one, and the language of the instructions puts a burden on naming even one.

Education and training. The connections between education and training, on the one hand, and entry into occupations on the other are often complicated. For some occupations, singular, direct, clearly marked requirements or pathways are quite well known. For many others, there are multiple routes, some of them obscure. Empirical data, "sums over histories," can be gathered from two perspectives: (1) What proportion of those who choose a certain state of education or training, say at Point A, are later found in a given occupational state, say at Point X? (2) What proportion of people in a given occupational state at X previously chose a certain state of education or training at A? (The proportion is invariably much larger for the latter perspective.) Working from either direction, one must define the transition states between A and X and determine analogous proportions from point to point. Such career trees traced prospectively and retrospectively are likely to be useful to students in

somewhat different ways.

While it is possible to deal with some of these complexities in the Planning section of SIGI and the Preparing section of SIGI PLUS, the scope of this workbook permits only a simplistic approach: In general, how many years of education or training beyond high school are required, recommended, or commonly found at entry into each occupation? Here, we are constrained to limit ourselves to credentials and not to extend into what has been learned in the course of an education or training program. The point is to allow students to see what occupations would not be ruled out by the level of education they specify. Therefore, students estimate how much education they are "willing and able" to complete: Any occupation requiring equal or fewer years of education can thus show up. (For a detailed description of various search rules, premises, and implications, see Katz & Shatkin, 1980.) If some occupation they would otherwise want to consider is ruled out because they plan on too low a level of education, they may want to change their plans to include additional education.

3. Occupational Information: Sources and Analyses

Ratings of occupations on various attributes for the student workbook were derived from the data bases in SIGI and SIGI PLUS. These data bases have been constructed and revised over a considerable period of years, with annual updates. The collection, interpretation, preparation, and documentation of the information used in SIGI have been described in a compendious volume (Pears & Weber, 1980), a handbook originally compiled for use by occupational analysts and later distributed more widely.

Briefly, all standard sources have been routinely collected -- e.g., U.S. Department of Labor and other governmental publications, occupational briefs and monographs, materials from professional associations and unions, periodicals, psychological and sociological research studies, etc. Loaded with data as they are, these familiar sources often do not quite

fit our structures for information. For example, none rated occupations in respect to the values dimensions or analyzed activities according to our constructs. Furthermore, such "bread and butter" information as salaries and wages were often obsolete by the time they were published. Therefore, we had to rely on as many primary sources as we could find for data (for example, recently completed and as yet unpublished salary surveys), evaluate sampling and survey methods, resolve discrepancies between various sources, decompose the data and then reconstruct and interpret them into information consistent with our structures.

By way of illustration, consider the problem of determining median income for an occupation (used in searching for occupations that meet or exceed a student's income specifications). Data from different sources will vary according to varying definitions of the occupation, sampling methods, reference to different time periods, inclusion of experienced workers only in one instance and beginners in another, and so on. Even when these discrepancies have been resolved, a "national average" must sacrifice a great deal of diversity from one region to another, from large city to small town, from union to nonunion, from one type of establishment to another (e.g., in industry, in education, in government); in such cases, the data have to be weighted according to numbers in each group. Quality of data vary from one occupation to another: For some, careful surveys are conducted annually; for others, surveys may be at five-year intervals, or of poor quality, or nonexistent. Thus, we have found that we can get good survey data for about a third of the SIGI occupations each year. Since these might be spaced throughout the year, it was necessary to project them to a uniform date. This procedure, using percentage changes in the Employment Cost Index (a Bureau of Labor Statistics series which disaggregates occupational groups according to their proportion in each industry), led the way to similar projections to uniform date from surveys

as much as several years old.

To test the validity of this procedure, we applied it to old data on occupations for which we had current data. Even in periods of high inflation, we found no significant differences between projected and actual data. This level of accuracy and currency differs in nontrivial ways from other resources. Compare it, for example, with the standard of salary information in the Occupational Outlook Handbook, which is at least two years old on publication date, and (since each issue of the Handbook remains in use for at least two years) may be four years old when read by students. Other resources often derive their material from the OOH, and are consequently much more out of date.

Obviously, achieving accuracy and currency of occupational information is not a one-shot task. It is a continual chore, like washing dishes. We hope that it will be possible to maintain the level achieved.

4. Design Features

There are many ways of presenting information. Our research, however, including a national survey of high schools, has demonstrated that existing occupational information goes largely unused (Chapman & Katz, 1981). Providing another resource that, no matter how valid the information, would go unread did not seem to represent a worthwhile contribution to students' CDM. It seemed desirable to attract students' attention and get them involved. Cartoon strips were used in each section because they tend to be eye-catching, introduce characters and situations that students can identify with, introduce some elements of story line and humor, and illustrate concepts in everyday applications.

The OCCU-FIND chart simulates some of the features of a computerized search and retrieval system. Its use, in conjunction with "Hits and Misses" strips that summarize the extent to which various occupations meet a student's specifications, can be virtually interactive. Students can

adjust their specifications and see what effect the revisions have on the list of occupations retrieved. They can quickly compare occupations in respect to a particular set of specifications. Use of the latent marks introduces an element of novelty and surprise: Something is revealed, "as if by magic."

CONCLUSION

But the real magic is to ask the right questions of the data base by specifying one's values, interests, skills, educational expectations, and aversions. Seeing the connections between specifications and occupations leads students to examine more closely what they want and can do. It leads them into a process of career decision making that they can learn in the course of actual use. Perhaps an important role for the counselor or teacher is to make this process explicit so that students can use it again as they make new decisions and plans at various points in their careers.

As the proverb says, "Give a man a fish and he will have a meal. Teach him how to fish and he will have meals for a lifetime."

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